

Graded Abrasion—A Treatment for Acne

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ACNE IS A DISEASE of the skin that begins in the pubertal years, may continue into adult life and is characterized by a series of pathophysiologic phenomena, beginning with a pilosebaceous imbalance in which more sebum is secreted than is excreted, causing plugging of the duct opening and the subsequent dermatopathologic course of events¹¹: Comedones, papules, pustules and cysts.

Over-secretion of sebum may be brought about by one or more of the following:

Hormonal stimulation.¹⁴

Irritation by certain foods or drugs—fish or halogen compounds,^{1,6} for example.

Congenitally large pilosebaceous duct openings.

Secondary infection by bacteria.

Emotional stresses of adolescence which increase the activity of the oil glands.

Complicating every type of acne are the numerous secondarily infected lesions produced by the young patients, and sometimes by their parents, in attempting to empty the contents of the lesions. These manipulations, often compulsive in character, frequently lead to unnecessary scarring and pitting.

Treatment

The aim of every physician who treats acne should be to produce a cosmetically acceptable result during the formative years, as well as a scar-free skin when the disease is outgrown or remitted. Ever since dermatologists became interested in the treatment of acne, their aims have been the same: To remove the plugged comedo, which removes much of the potential pathology and ultimate scarring. Although they have employed many means, there has been only one fundamental thought—to get rid of the blackhead.

The present-day treatment of acne generally includes x-radiation, antibiotics by mouth, toxoids and vaccines, local keratolytic agents, hormones and expression of fluctuant lesions.

Since the advent of the use of x-ray,¹⁰ there has been little written concerning local regimens except for the sporadic papers on the use of various antibiotics locally as they become available.^{2,3}

Dermabrasion,^{8,9} has recently found its place in the treatment of acne sequelae. The present report deals with the development and description of a treatment

• Long term continuous superficial abrasion with abrasive compounds of various degrees of roughness was used over an 11-year period in over 1,500 patients with acne of all types. The following observations were made:

• That when a material with a specific abrasive quality is used for a period, desquamation stops despite continued use of the material, and then use of material of the next higher degree of roughness is indicated until the patient's skin is blackhead-free and minutely flaky.

• When long term continuous superficial graded abrasion is used alone or with other treatment, it permits the young patients to outgrow the disease with little or no scarring.

• The routine of abrasive washing seems in a large measure to replace the constant fingering of lesions by the patient.

• No untoward effects were observed clinically. There was no hyperpigmentation of Negro or Caucasian skins.

technique which utilizes long term continuous superficial abrasion during the active phases of acne and seems in a large measure to minimize and prevent the sequelae.

Development of the Concept of Superficial Abrasion

It is common knowledge that most patients with acne appear improved during the summer months following exposure to more intense sunlight, and that relapses occur with the disappearance of the suntan. It can then be supposed that during the exposure to sunlight, desquamation (minute or obvious) takes place, unplugging the pilosebaceous openings; and that when this desquamation stops, the plugs are re-formed and the acne continues.

Efforts to treat patients with mercury vapor quartz lamp radiation are not noticeably successful; nor has the response to the periodic use of peeling pastes been uniformly satisfactory. Many discussions in recent literature deal with the importance of keeping the skin dry and minutely desquamated, implying the use of increasing amounts of keratolytic agents in local medicaments.¹⁵ Recently the use of various synthetic detergents, with and without added keratoplastic and keratolytic agents, has been widely prescribed. While helpful in some cases, these agents are often extremely drying and fail to accomplish the mild, continuous and prolonged desquamation

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that results from sunlight and that seems essential for sustained improvement.

A search was instituted for a single treatment regimen which would induce sustained, continuous desquamation, thereby reducing the number of comedones, papules, pustules and cysts. The use of topically applied abrasives and keratolytic drugs is not new,¹⁵ but little has been written about the long continued use of these agents because the very properties which make them therapeutic also make them irritating.

This presentation outlines an explicit treatment regimen, utilizing graded abrasion as the central therapeutic principle^{12,13} in the general treatment of acne.

Many of the patients in the present study complained of intense scaling and redness of the skin after use of the then available abrasive agents that were prescribed at first. However, when the desquamation subsided, the number of comedones was fewer, and the skin appeared smoother. It then seemed wise to reduce the number and/or size of the abrasive particles and to incorporate them in a cleansing base. With this change, both the therapeutic value and the cosmetic acceptability were enhanced.

The original abrasive was chosen arbitrarily and progressively diluted with British Soap Base N. F., until it was possible for patients to use it for long periods without extreme irritation. Through the years, by trial and error, it was learned that polygonal particles harder* than 7 (by Moh's Index)⁷ were most desirable and that the abrasion was enhanced when particles of many sizes were used simultaneously. Various abrasive particles were tried, but fused synthetic aluminum oxide,^{†5} exhibiting no piezoelectric current⁴ was found effective and without granuloma producing properties.

Attempts to potentiate the cleansing acts of soaps or detergents by the use of rough washcloths or facial brushes were unsuccessful, since the presence of hard particles is apparently essential for optimum therapeutic results.

The aim of this treatment is to create desquamation mild enough to be cosmetically compatible with daily living, but therapeutically capable of maintaining patency of the pilosebaceous follicles.

For eleven years, every patient in this study, regardless of the kind of acne, used this long-term continuous superficial abrasion. During these years, less than five patients a year were given roentgen radiation, although the number of patients treated exceeded 1,500. This unusually long clinical trial made possible many observations not previously described.

Continuous abrasion was used alone in the mild comedonal acne, and in addition to other conventional treatment in the more severe types. The few patients who did receive x-ray treatments were usually over 18 years of age, and they were only slightly more improved than those receiving the abrasive treatment alone. No hormones were included in the treatment regimen.

Technique and Observations

The general technique is as follows: On the patient's first visit, a complete history is taken regarding previous treatment, allergic sensitivity to contact materials, course of acne and oiliness of skin. The mildest abrasive soap paste is prescribed.[‡] The patient is told to apply it without moistening the skin, to rub it in well with a rotary motion for approximately ten counts to each area and then remove with a washcloth and hot water. The entire washing time takes from one to two minutes—not much longer than the ordinary cleansing routine. This is done three times daily until dryness, redness and desquamation occur. It is emphasized that these reactions are desirable for good therapeutic results, and only if the skin is irritated should the abrasion be interrupted for a day or two. Then the routine is resumed, the patient being told to notice that despite the previous irritative reaction, no further obvious scaling occurs.

After a proper interval, the patient is examined and questioned to make certain that instructions are properly followed, and resistant blackheads may be expressed at that time.

At the end of three or four weeks, the skin appears smoother and the comedones are significantly reduced in number. There may even be a return of oiliness. The next higher grade of abrasive soap paste (medium[§]) is then prescribed with identical instructions, and the same sequence of events occurs—erythema, dryness and scaling; and these reactions again stop despite continued use of this grade of abrasion paste. By this time, most of the comedones are gone, the skin is smoother appearing and previous pitting is less noticeable.

When the skin remains oily even with continued use of the medium grade, it is time to increase the abrasive strength.[¶] Each patient seems to reach an equilibrium, depending on the kind of skin and the kind of acne he has. The optimum therapeutic effect is attained when the skin remains comedo-free and minutely flaky.

Abrasive soap pastes are prepared in three grades, and in addition a paste with the same base but con-

*Index of particle Hardness: A property of substances determined by their ability to abrade or indent one another.

†Available as Brasivol® (Stiefel Laboratories, Oak Hill, New York).

‡Brasivol® Fine. (Stiefel Laboratories, Oak Hill, N. Y.)

§Brasivol® Medium.

¶Brasivol® Rough.

taining no abrasive particles is available. The physician or patient can thus increase the abrasion when necessary (in times of stress and increased oiliness) or decrease it when too much desquamation occurs, as it may with increased exposure to sunlight, or with maturity when the skin is naturally drier.

It was observed that patients soon learn to control the degree of abrasion and often keep various strengths at home to use as the condition of their skin demands.

This long term continuous superficial graded abrasion is used in all patients with acne vulgaris, regardless of other treatment, which may include adjunctive treatment. When improvement is accomplished, the adjunctive treatments are discontinued but the abrasion is continued.

Most patients improve appreciably after six weeks of continuous superficial graded abrasion. The patient's tendency to finger and to squeeze the lesions disappears almost entirely, for there are fewer of them and the abrasion routine appears to replace the emotional need to scrutinize and express each lesion. Some patients become careless about the routine and omit the abrasive once the lesions abate, but oiliness and comedones then soon reappear.

Many young patients who have had severe acne with pitting have used this method for several years without consistent medical observation. When seen some months or years later, their acne pits are almost imperceptible.

The same technique is used for patients in their late twenties or in their thirties who have pits and scars but are reluctant to have abrasive treatment with a wire brush or are not suited to this technique.³ For them, subjective and objective improvement is excellent after six months of this graded abrasion.

It was also found that if mild abrasion is begun after the erythema subsides following wire brush

operations, the usual oiliness and small milial cysts do not appear.

Recently, this continuous superficial abrasion was also used for hyperkeratosis palmaris or plantaris due to tinea.

No hyperpigmentation after prolonged use was seen in Negro or Caucasian skins.

The contraindications are few. When there are a number of superficial venules (in rosacea) and/or telangiectasia (actinic sequelae), harsh abrasion is naturally avoided.

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||Brasivol® Base. The particle-free base is used in cases in which previously the skin was not washed often enough; in cases in which the skin is very sore with irritated acne or cystic pustular acne; in areas of impetiginization; when the skin gets too irritated during the abrasion phases; when there has been a superimposed sunburn; and at any time when the skin is irritated or sore either before the active abrasion technique is started or during the phases of abrasion. It is also indicated in mature women who have been used to cold creams for cleansing and who have subsequently developed acneiform eruptions. When acneiform or crusted lesions form in the scalp, it is beneficial as a shampoo.